

**Math 10C**

**Radicals Check**

Name: KEY

You should get a score better than 11/16 to be considered successful in working with radicals.

1. State if the below numbers are rational (Q) or irrational ( $\bar{Q}$ ). 1 mark each.

a.  $\sqrt{\frac{49}{16}}$   
Q

b.  $\sqrt[3]{30}$   
 $\bar{Q}$

c.  $\pi$   
 $\bar{Q}$

2. Put the following numbers in order from least to greatest. You must answer by rewriting the number shown, not by labeling the numbers '1', '2' or by stating a decimal approximation of the number. (2 marks)

$$\frac{-18}{7}, -\frac{300}{99}, -\sqrt{8}, \sqrt[3]{-33}, -\sqrt{\frac{27}{3}}$$

$$-2.5714 \quad -3.030 \quad -2.828 \quad -3.207 \quad 3$$

$$3\sqrt{-33}, -\frac{300}{99}, \sqrt{8}, \frac{-18}{7}, -\sqrt{\frac{27}{3}}$$

3. Convert the following to entire radicals. (1 mark each)

a.  $3\sqrt{7}$   
 $\sqrt{7 \times (3)^2}$   
 $\sqrt{63}$

b.  $-2\sqrt{11}$   
 $\sqrt{11 \times (-2)^2}$   
 $\sqrt{44}$

c.  $2\sqrt[3]{5}$   
 $\sqrt[3]{5 \times (2)^3}$   
 $\sqrt[3]{40}$

4. Convert the below entire radicals to mixed radicals. (2 marks each)

a.  $\sqrt{80}$   
 $\sqrt{16} \times \sqrt{5}$   
 $4\sqrt{5}$

b.  $\sqrt{125}$   
 $\sqrt{25} \times \sqrt{5}$   
 $5\sqrt{5}$

c.  $2\sqrt{216}$   
 $2 \times \sqrt{36} \times \sqrt{6}$   
 $2 \times 6 \times \sqrt{6}$   
 $12\sqrt{6}$

d.  $\sqrt[3]{108}$   
 $\sqrt[3]{27} \times \sqrt[3]{4}$   
 $3\sqrt[3]{4}$

e.  $\sqrt[3]{243}$   
 $\sqrt[3]{27} \times \sqrt[3]{9}$   
 $3\sqrt[3]{9}$

f.  $2\sqrt[3]{512}$   
 $2 \times 8$   
 $16$

**Math 10C****Fractional Exponents CHECK**

You should get a score better than 11/16 to be considered successful in working with fractional exponents.

1. Write each power as a radical. (1 mark each)

a.  $4^{\frac{1}{3}}$

$$(\sqrt[3]{4})^1$$

b.  $144^{\frac{4}{5}}$

$$(\sqrt[5]{144})^4$$

c.  $-27^{\frac{2}{3}}$

$$(\sqrt[3]{-27})^2$$

2. Write each radical as a power. (1 mark each)

a.  $(\sqrt{35})^1$

$$35^{\frac{1}{2}}$$

b.  $\sqrt[3]{3^5}$

$$3^{\frac{5}{3}}$$

c.  $(\sqrt[3]{-27})^4$

$$(-27)^{\frac{4}{3}}$$

3. Evaluate. Show all your steps. (2 marks)

a.  $16^{\frac{1}{4}}$

$$(\sqrt[4]{16})^1$$

$$2$$

b.  $81^{\frac{3}{4}}$

$$(\sqrt[4]{81})^3$$

$$(3)^3$$

$$27$$

c.  $32^{\frac{4}{5}}$

$$(\sqrt[5]{32})^4$$

$$(2)^4$$

$$16$$

d.  $\left(\frac{16}{9}\right)^{\frac{3}{2}}$

$$\frac{(\sqrt[2]{16})^3}{(\sqrt[2]{9})^3}$$

$$\left(\frac{4}{3}\right)^3$$

$$\frac{64}{27}$$

e.  $\left(\frac{1}{216}\right)^{\frac{1}{3}}$

$$\frac{1}{(\sqrt[3]{216})^1}$$

$$\frac{1}{6}$$

**Math 10C**

**Negatives Exponents and Reciprocals Check**

To be considered successful, you should get a minimum mark of 15/21.

1. Write the following with *positive* exponents, do NOT calculate: (1 mark each)

a.  $\left(\frac{2}{3}\right)^{-7}$

$\left(\frac{3}{2}\right)^7$

b.  $18^{-6}$

$\frac{1}{18^6}$

c.  $(-23)^{-5}$

$\frac{1}{(-23)^5}$

2. Write the following with *positive* exponents, do NOT calculate. Then convert into radical form. (2 marks each)

a.  $\left(\frac{-3}{14}\right)^{\frac{4}{5}}$

$\left(\frac{14}{-3}\right)^{\frac{4}{5}}$

b.  $\left(\frac{5}{12}\right)^{\frac{1}{3}}$

$\left(\frac{12}{5}\right)^{\frac{1}{3}}$

c.  $\left(-\frac{1}{16}\right)^{\frac{2}{3}}$

$(-16)^{\frac{2}{3}}$

3. Convert the following radicals into exponential form with a positive exponent. (2 marks each)

a.  $\sqrt[3]{15^{-2}}$

$15^{-\frac{2}{3}}$

$\frac{1}{15^{\frac{2}{3}}}$

b.  $\sqrt[2]{\left(-\frac{3}{4}\right)^{-5}}$

$\left(-\frac{3}{4}\right)^{-\frac{5}{2}}$

$\left(\frac{4}{-3}\right)^{\frac{5}{2}}$

4. Evaluate. (2 marks each)

a.  $\left(\frac{49}{81}\right)^{-\left(\frac{3}{2}\right)}$

$\left(\frac{81}{49}\right)^{\frac{3}{2}} = \frac{(\sqrt{81})^3}{(\sqrt{49})^3} = \frac{(9)^3}{(7)^3} = \frac{729}{343}$

b.  $256^{\frac{-3}{4}}$

$\frac{1}{256^{\frac{3}{4}}} = \frac{1}{(\sqrt[4]{256})^3} = \frac{1}{(4)^3} = \frac{1}{64}$

c.  $\frac{-27^{\frac{4}{3}}}{1}$

$\left(\sqrt[3]{-27}\right)^4$

$\left(\frac{1}{-3}\right)^4$

$\frac{1}{81}$

d.  $\left(\frac{81}{16}\right)^{\frac{3}{4}}$

$\left(\frac{16}{81}\right)^{\frac{3}{4}}$

$\frac{(\sqrt[4]{16})^3}{(\sqrt[4]{81})^3} = \frac{(2)^3}{(3)^3} = \frac{8}{27}$

